CLAIMS

1. An eddy-current sensor for nondestructive testing, comprising:

a planar exciting coil at least having a pair of current lines in parallel with each other through which exciting currents flow in opposite directions to each other during the testing, for generating an alternative magnetic field applied to a subject to be nondestructively tested by said exciting currents, and

at least one magnetoresistive element positioned on a central axis between said pair of current lines and on the opposite side to said subject in relation to said exciting coil, for detecting a magnetic field generated newly from said subject by an eddy-current induced by said alternative magnetic field.

2. The sensor as claimed in claim 1, wherein said at least one magnetoresistive element is at least one giant magnetoresistive element or at least one tunnel magnetoresistive element.

3. The sensor as claimed in claim 2, wherein each of said at least one giant magnetoresistive element or at least one tunnel magnetoresistive element comprises a multilayered film laminated in parallel with a planar plane of said exciting

coil.

4. The sensor as claimed in claim 3, wherein said multilayered film includes a pinned-magnetization-direction layer, and said pinned-magnetization-direction layer is magnetized in parallel with said pair of current lines.

5. The sensor as claimed in claim 3, wherein said multilayered film includes a free-magnetization-direction layer, and said free-magnetization-direction layer under the condition without any external magnetic field is magnetized perpendicularly to said pair of current lines.

6. The sensor as claimed in claim 1, wherein said at least one magnetoresistive element comprises a chip substrate, a single magnetoresistor formed on said chip substrate, and at least one thin-film chip each of which has a pair of electrode terminals connected to both ends of said single magnetoresistor, and said at least one thin-film chip is bonded on said exciting coil.

7. The sensor as claimed in claim 1, wherein said at least one magnetoresistive element is a single magnetoresistive element positioned on a central axis between said pair of current lines.

8. The sensor as claimed in claim 1, wherein said at least one magnetoresistive element is a plurality of magnetoresistive elements aligned on a central axis between said pair of current lines.

9. The sensor as claimed in claim 1, wherein said at least one magnetoresistive element comprises a chip substrate, a plurality of magnetoresistors formed on said chip substrate, and at least one thin-film chip each of which has a plurality of pairs of electrode terminals connected respectively to both ends of said a plurality of magnetoresistors, and said at least one thin-film chip is bonded on said exciting coil.

10. The sensor as claimed in claim 9, wherein said at least one thin-film chip is a single thin-film chip, positioned on a central axis between said pair of current lines and bonded on said exciting coil.

11. The sensor as claimed in claim 9, wherein said at least one thin film chip is a plurality of thin-film chips, aligned on a central axis between said pair of current lines and bonded on said exciting coil.

12. The sensor as claimed in claim 1, wherein said exciting

coil is a meander-type coil.

13. The sensor as claimed in claim 1, wherein said exciting coil comprises a coil conductor layer formed on a substrate and an insulating layer covering said coil conductor layer.